COLLECTION AND ANALYSIS OF VITAL SIGNS

This application claims the benefit of U.S. provisional patent application No. 61/401,179 filed Aug. 6, 2010 and entitled "System for Real-Time Collection and Analysis of Vital Signs and Prediction of Clinical Outcomes," which is hereby incorporated by reference.

I. FIELD OF THE INVENTION

This invention relates to a system and method for developing, testing, and evaluating decision-support algorithms in a portable unit using stored data and/or real-life, real time data.

II. BACKGROUND OF THE INVENTION

Typically, decision-support algorithms are incorporated into vital-sign monitors and other medical recording systems. This results in the algorithms being proprietary to the manufacturer and not facilitating easy modification or refinement by end-users and/or testing of new decision-support algorithms by either the manufacturer or the end-users.

Most of the existing literature discusses research in the decision-support area that uses retrospective analysis of previously gathered data to test and refine decision-support systems located on workstations and/or servers.

III. SUMMARY OF THE INVENTION

The invention provides in at least one embodiment a system for receiving an output from an external source where the system includes: a storage; a communications module for receiving vital-sign data from an external source and storing the received data in said storage; an analysis controller in communication with said storage, said analysis controller monitors said storage; and a test module in communication with said analysis controller and said storage, said test module receives information from said storage through said analysis controller and stores any output in said storage, and said test module includes running means for running at least one algorithm loaded into said storage where said at least one algorithm processes at least a portion of the information provided by said analysis controller.

The invention provides in at least one embodiment a system for receiving vital-sign information from a vital-sign monitor, said system including: a storage having at least one database; a communications module for receiving vital-sign data from an external source and storing the received data in said database of said storage; an analysis controller in communication with said storage, said analysis controller monitors said storage; a test module in communication with said analysis controller and said storage, said test module receives information from said storage through said analysis controller, and said test module includes running means for running at least one algorithm loaded into said storage where said at least one algorithm processes at least a portion of the information provided by said analysis controller, said running means provides an output in substantially real time from receipt of vital-sign data by said communications module; a ruggedized, compact housing enclosing said storage, said communications module, said analysis controller, and said test module.

The invention provides in at least one embodiment a method for testing decision-support algorithms where the method includes: receiving into storage of a ruggedized, compact computer at least one decision-support algorithm; detecting with a communications module the initiation of a vital-sign monitoring session; receiving and storing vital-sign information into storage by the communications module; pushing the stored vital-sign information by an analysis controller to a test module running the stored at least one decision-support algorithm; and providing at least one output from the decision-support algorithm to at least one of a database and a display.

Given the following enabling description of the drawings, the invention should become evident to a person of ordinary skill in the art.

IV. BRIEF DESCRIPTION OF THE DRAWINGS

The present invention is described with reference to the accompanying drawings. In the drawings, like reference numbers indicate identical or functionally similar elements. The use of shading within the drawings is not intended as limiting the type of materials that may be used to manufacture the invention.

FIG. **1** illustrates a block diagram including a data flow according to an embodiment of the invention.

FIG. **2** illustrates a block diagram according to an embodiment of the invention.

FIG. **3** illustrates an embodiment according to the invention.

FIG. **4** illustrates a flowchart of a method embodiment according to the invention.

FIG. **5** illustrates a computer program product and computer implementation according to an embodiment of the invention.

V. DETAILED DESCRIPTION OF THE DRAWINGS

FIGS. **1-4** illustrate different embodiments and aspects according to the invention.

In at least one embodiment, the system **100** is compact, which for this disclosure is defined as being easily moved and transported, for example, between a vehicle such as an ambulance or helicopter to a medical facility with the patient. Compact is further defined as smaller than a laptop and small relative to a vital-sign monitor **190** such as illustrated, for example, in FIG. **3**. Compact is further defined by being of sufficiently small size to allow for use in the field away from established medical facilities.

In at least one embodiment, the system is ruggedized, which for this disclosure is defined as being able to substantially withstand vibration, shock, temperature, temperature shock, altitude, dropping, rain, dust, and humidity and remain substantially working and operational for its intended purpose.

In at least one embodiment, the system operates in real time, which for this disclosure is defined as storing and processing a continuous stream of vital-sign information (or data) as outputted by a vital-sign monitor where the processing includes any algorithm **1254** present in the test module **125** with substantially minimal lag time (e.g., allows for processing time by the algorithm(s) **1254**).

As illustrated in FIG. **1**, the flow of data through at least one embodiment includes a system **100** having a communications module **110**, a storage **115**, an analysis controller **120**, and a test module **125**. The communications module **110** is in communication with the storage **115**. The analysis controller **120** is in communication with the storage **115** and the test module **125**, which in at least one embodiment is in communication with the storage **115**. As used in this disclosure "in commu-